

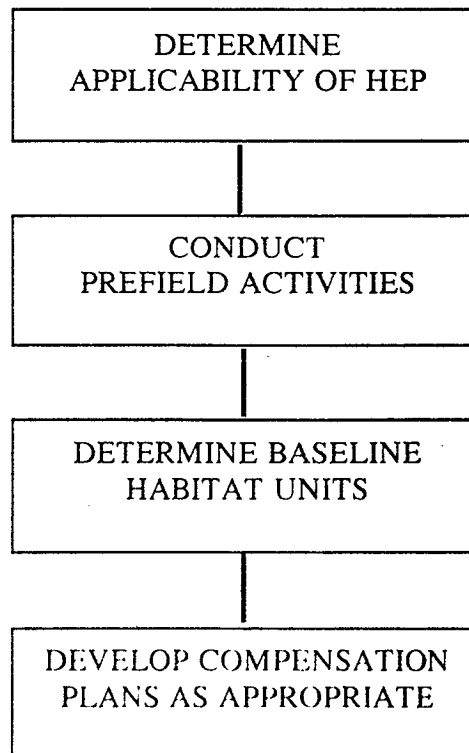
HABITAT EVALUATION PROCEDURES (HEP)

The Habitat Evaluation Procedures have been developed in response to the need to document the nonmonetary value of fish and wildlife resources and is based on the assumption that habitat quality and quantity can be numerically described. This numerical description allows options and alternatives to be compared for impact assessment.

HEP is a species-habitat approach to impact assessment and the habitat quality for selected evaluation species is documented with an index, the Habitat Suitability Index (HSI). This value is derived from an evaluation of the ability of key habitat components to supply the life requisites of selected species of fish and wildlife. Evaluation involves using the same key habitat components to compare existing habitat conditions and optimum habitat conditions for the species of interest.

HEP may be adapted to many different uses including project planning, impact assessment, mitigation and compensation, and habitat management by providing information for two types of wildlife comparisons: (1) the relative value of different areas at the same point in time, and (2) the relative value of the same area at future points in time.

HEP PROCESS



Determine Applicability of HEP

- Wildlife habitat assessments
- Trade-off analyses
- Compensation analyses

Prefield Activities

- Form a HEP team
- Develop study objectives
- Delineate study boundaries
- Assemble available data
- Delineate cover types
- Select evaluation species/HSI models
- Design the inventory

Determine Baseline Habitat Units

Baseline assessments are used to describe existing ecological conditions and can be used to predict and compare changes that may occur. The objective is to calculate the number of Habitat Units (HU's) for each evaluation species. HU is the Habitat Suitability Index (HSI) derived from each model, multiplied by the number of acres for that habitat type.

Develop Compensation Plans As Appropriate

Compensation studies identify measures that would offset unavoidable HU losses due to a proposed land use action. Two examples of management plans that can be developed to meet specific compensation goals:

In-kind compensation

In-kind compensation is intended to replace losses of HU's for an evaluation species with equal gains in HU's for that same species. This type of compensation is also called in-kind with no trade-off.

Equal replacement

Equal replacement allows for the gain of one HU to be used to offset the loss of one HU for any evaluation species.

GREATER YELLOWLEGS PORTIONS OF THE SUITABILITY INDEX MODEL

Variable 1: Presence of shallow water or moist soil.

Suitability Index = 1.0 if shallow water (< 7 inches or vegetation with moist soil) is present.

Suitability Index = 0.0 if shallow water (< 7 inches or vegetation with moist soil) is absent.

Variable 2: Short (< 3 inches), open (< 50%) vegetation.

Suitability Index = 1.0 - 0.8 if vegetation is short (\leq 3 inches) and open (\leq 50% cover).

Suitability Index = 0.7 - 0.5 if vegetation is short (\leq 3 inches) and dense (\geq 50% cover).

Suitability Index = 0.4 - 0.2 if vegetation is tall (> 3 inches) and open (\leq 50% cover).

Suitability Index = 0.1 - 0.0 if vegetation is tall (> 3 inches) and dense (> 50% cover).

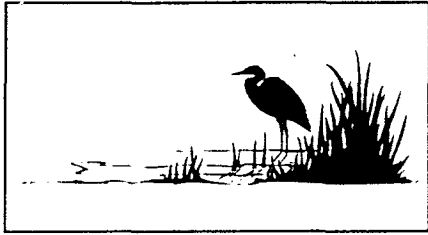
HSI Determination

Habitat Suitability Index (HSI) equals

$$\frac{V1 \times V2}{2}$$

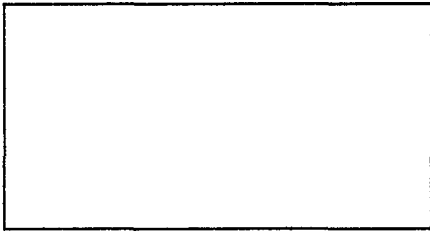
HYPOTHETICAL CA

No Project:



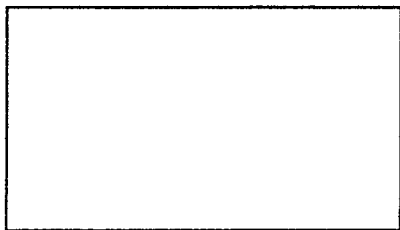
$$\text{HSI of } 0.3 \times 10 \text{ acres} = 3 \text{ Habitat Units}$$

With Project:



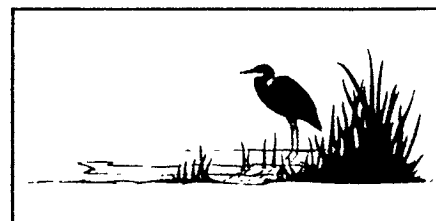
$$\text{HSI of } 0.0 \times 10 \text{ acres} = 0 \text{ Habitat Units}$$

Mitigation Site
Prior to Improvement:



HSI of 0.0 x 10 acres
= 0 Habitat Units

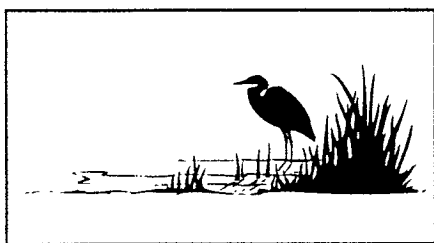
Mitigation Site
After Improvements:



HSI of 0.3 x 10 acres
= 3 Habitat Units

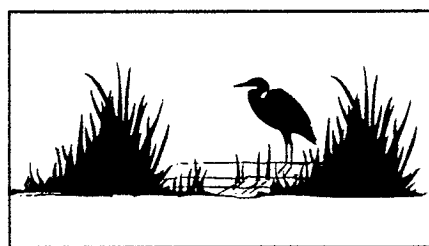
OR

Mitigation Site
Prior to Improvement:



HSI = 0.3

Mitigation Site
After Improvements:



HSI = 0.4

$0.4 - 0.3 = 0.1 \times 30 \text{ acres} = 3 \text{ Habitat Units}$

INDP HEP TASKS

DELINEATE STUDY AREA

DELINEATE COVER TYPES

CALCULATE ACREAGES OF THE COVER TYPES

SELECT EVALUATION SPECIES

MODIFY MODELS

CALCULATE HSI

CALCULATE HU FOR EACH COVER TYPE (BASELINE ASSESSMENT)

SELECT TARGET YEARS

COVER TYPE MAPS FOR FUTURE CONDITIONS (EACH TARGET YEAR)

CALCULATE AAHUS

CALCULATE NET IMPACTS (AAHU WITH - AAHU WITHOUT)

ASSUMPTIONS TO BE AGREED UPON BY HEP TEAM MEMBERS

- ▶ Agricultural and land use cover types
- ▶ Average vegetation height in inches and percent ground cover by crop type
- ▶ Value of disturbance variable in the tundra swan and northern pintail models
- ▶ Variable values determined by aerial photographs or assumptions
- ▶ Seasons for use of agricultural information for each selected model

SELECTED MODELS BY HABITAT TYPE

Vernal Seasonal Wetlands
Short-eared owl
Greater yellowlegs
California vole
Orchards and Vineyards
California quail
Ring-necked pheasant
California vole
Grain & Row Crops/Managed Seasonal Wetlands
California quail
Ring-necked pheasant
Northern pintail
Tundra swan
Riparian
Riparian songbird guild
Northern oriole
Sharp-shinned hawk
Shaded Riverine Aquatic
Shaded Riverine Aquatic
Emergent Wetlands/Irrigation Ditches
Marsh wren
Tricolored blackbird
Riparian Scrub-Shrub
Desert cottontail
California vole

August 24, 1995